Building and Appliance Efficiency Office

Blueprint

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California Energy Commission

RESIDENTIAL STANDARDS

Questions and Answers

Q ***For metal frame/steel stud houses, will R-13 insulation installed between the metal studs meet the minimum mandatory wall insulation requirement? What effect will this type of construction have on my compliance calculations?***

While the R-13 insulation will meet minimum mandatory requirements, all compliance approaches require that you account for the effects of the metal framing.

Under the *prescriptive* compliance approach the metal framed wall U-value can be no greater than a U-value for a wood framed wall (compare ***Residential Manual*** Tables G-17 and G-20). An ASHRAE zone calculation or manufacturer's tested data are required to demonstrate this equivalent U-value (Form 3R cannot be used for metal frame walls). The *point system* R-value tables can only be used for wood frame construction, requiring that you use U-values from ***Residential Manual*** Table 4-4, an ASHRAE zone calculation, or manufacturer's tested data for your points calculations. *Computer performance* compliance also requires an assembly U-value.

Using a point system example to demonstrate the effects of metal framed walls on compliance, Table 4-4 shows that a wall (24" o.c.) with R-13 has a U-value of 0.159, while a wood frame wall with R-13 has a U-value of 0.085. A house in Climate Zone 9

Q with a wood frame R-13 wall is given 0 points; the interpolated points for this same wall with metal framing are -9 points.

For compliance with the 1992 Energy Efficiency Standards, do all computerized "points" programs need certification by the California Energy Commission?

Yes. In addition to a P-2R, certified programs will produce a C-2R form as part of the

Q program output. If a program is not on a Commission list of approved compliance programs, it should be plan checked as a hand-written point system submittal.

Do decorative gas appliances need glass or metal doors?

As defined in the ***Energy Efficiency Standards***, Section 101, decorative gas appliances do not need doors. The door requirement applies to masonry or factory-built fireplaces only (Section 150(e)1). **Note**: If a decorative gas appliance is installed

Q *inside a fireplace*, the fireplace needs doors. Consult the manufacturer of the decorative gas appliance regarding combustion air requirements as well as health and safety considerations before placing such an appliance in a fireplace with doors.

Can I use single-pane windows or single-pane skylights?

New buildings or additions, using a *performance* approach (points, computer), may be able to achieve compliance with single-pane glass. How easy or difficult it is to make up the lost energy efficiency will depend on the

climate zone and building design.

Q New buildings or additions showing com-pliance using *prescriptive* standards and *alterations* are limited to a maximum U-value for fenestration products which prevents the use of single-pane glass.

The Energy Efficiency Standards (EES) (Section 150(h)) require load calculations but they do not have to be submitted with compliance documentation unless requested by the building department (Residential Manual, Table G-1). Under what circumstances would a copy of load calculations be requested?

Although the Energy Commission does not interpret the ***Uniform Building Code (****UBC****)***, EES Section 150(h) makes reference to a requirement for minimum heating capacity per UBC Section 1212. The building

Q department is required to enforce this requirement and may request load calculations for verification. The Administrative Regulations, EES Section 10-103(a)(3)(B), allow the enforcement agency to request any reasonable information necessary to determine that the building, as constructed, complies with the ***Energy Efficiency Standards.***

When do the Uniform Mechanical Code (UMC) guidelines for duct installation apply, and when do the Energy Efficiency Standards (Section 150(m)) apply?

Both apply concurrently. The UMC, adopted by reference in the ***Energy Efficiency Standards***, covers thermal performance, installation and sealing requirements. The ***Energy Efficiency Standards*** set a minimum thermal performance requirement for duct insulation (R-4.2 minimum) which usually supersedes the insulation

Q requirements from UMC Section 1005 (higher insulation levels may be required by the UMC in areas with 8,000 or more degree days, depending on duct location). [**Note**: This information is Energy Commission staff's summary of UMC requirements. Commission staff are not authorized to interpret the UMC or any codes other than the ***Energy Efficiency Standards*** and its administrative requirements.]

What are the modeling assumptions for evaporative coolers?

Assume there is a split system air conditioner with either an SEER of 11.0 for direct systems or 13.0 for indirect/direct

Q systems. Whether the system has ducts or not, for modeling purposes, the ducts are assumed to be in the attic with R-4.2 insulation ("standard" distribution system). There are additional eligibility and installation criteria in the ***Residential Manual*** (pages G-18 - 19). Evaporative cooler credit is not allowed for multi-family buildings, which must use "no cooling" assumptions in compliance calculations.

What are the compliance requirements for replacing equipment such as air conditioning systems or water heaters that are not part of an addition? What if the replacement unit is bigger?

Replacing equipment is considered an alteration and the replacement unit must meet applicable mandatory requirements (***Energy Efficiency Standards*** Sections 110 - 118 and 150). In the case of HVAC

Q systems, the equipment must be certified and any new ducts require R-4.2 insulation. Load calculations may be required by the building department (particularly when the replacement unit is larger). A setback thermostat for specific system types is only required if the thermostat is being replaced. Replacement water heaters (which can be larger) must be certified and, if new pipes are installed, have the appropriate pipe insulation as required by Section 150(j).

Since there are national appliance efficiency standards, can ARI directory data (or some other national

Question and Answers (continued)

Q ***organization's data) be used in place of Energy Commission directory data in compliance calculations?***

Q If the unit is certified to the Energy Commission (as required by ***Energy Efficiency Standards***, Section 111), either the Commission's or a more conservative efficiency value can be used. The Commission is working with national trade associations to coordinate the certified data. If there are discrepancies between the values, please contact the Energy Commission directly.

Is Laguna Hills in Climate Zone 6 rather than Zone 8 as listed in the Residential Manual?

Yes, Laguna Hills is in Climate Zone 6.

Can you explain how I would show compliance for a water heater without an additional R-12 insulation wrap, using the point system for compliance?

Water heating points are obtained by adding together three values from Table 12 (p. 4-102) of the ***Residential Manual***:

Q (1) Points for the water heater (from Table
12 or DHW-1, Line 5)
(2) Points for tank insulation—negative points
when there is no insulation (the points will
vary by the volume, type and number of water heaters)
(3) Points for the house size adjustment

For example, a 50-gallon gas water heater with an energy factor of 0.53 (0 points) with no external insulation (-2 points) in a 1,600 square foot house (0 points) has a water heating score of -2 points (P-2R, item 12). As long as the "Point Total" is 0 or positive you have achieved compliance.

Is a detached addition to an existing residence (with no breezeway) an addition or a new building?

This depends on the type of permit issued by

NONRESIDENTIAL STANDARDS

Questions and Answers

Q ***The MECH-1 form has a section entitled "proof of envelope compliance" with two boxes—"previous envelope permit" or "envelope compliance attached." How do I determine which box to check, particularly for a mechanical permit on a building built before energy standards existed? Don't the standards only apply to the permitted work?***

For a building built before energy standards, and for any conditioned space with tenants, check the "previous envelope compliance" box.

If there was no previous tenant, or the space was occupied but unconditioned, check "envelope compliance attached" and attach either a copy of previously submitted documentation or current compliance documentation.

Although the standards only apply to the construction which is the subject of the permit, some building owners chose to designate their buildings (particularly multi-tenant shells) unconditioned for purposes of energy compliance, delaying energy compliance until a space became conditioned. In such a case, when the permit for mechanical equipment is sought, it is to condition a previously unconditioned space (an "addition") and requires envelope compliance.

Q ***Drop ceilings are required to be caulked, gasketed or otherwise sealed to prevent air leakage (Energy Efficiency Standards, Section 117). If each ceiling tile and drop-in luminaire (including any holes in the luminaire) is caulked, gasketed or sealed with tape, does this meet this requirement? Would "one-hour clips" meet this requirement?***

(continued on page 4)

Questions and Answers (continued)

Yes, sealing each individual tile and fixture or using one-hour fire-rated acoustical tiles with clips will meet the requirements of Section 117. For any assembly where IC-rated light fixtures are not used, envelope calculations must account for no insulation on the light fixtures.

Q ***If I have a building with more than one occupancy type, can I meet one set of standards for the dominant occupancy? Do I meet the mandatory measures applicable to the dominant occupancy?***

The exception to Section 100(e) of the ***Energy Efficiency Standards*** allows you to show compliance with the standards applicable to the dominant occupancy for the entire building if the dominant occupancy makes up at least 90 percent of the conditioned floor area. You must, however, meet the mandatory measures applicable to the actual occupancies, not the dominant occupancy.

Q ***If I have an unconditioned warehouse with a small office (consisting of less than 10 percent of the building), is the office exempt under the mixed occupancy exception?***

No. The exception to Section 100(e) applies to conditioned floor area in buildings within the scope of the ***Energy Efficiency Standards*** (Section 100(a)).

Q ***When using the prescriptive compliance approach for a building envelope, are doors included in the gross exterior wall area? Do the doors need to meet any U-value requirements?***

The gross wall area is the entire area of exterior surfaces, including windows and doors. Demising walls (walls between conditioned space and enclosed unconditioned space) and party walls are not counted as gross exterior wall.

There are no maximum U-value requirements applicable to doors in either the component or overall envelope compliance methods (prescriptive). Aside from the area of doors being included in the gross exterior wall area, and any glazing in doors included as window area, opaque doors are not included in prescriptive compliance calculations.

Q ***When calculating equipment loads and indicating equipment selection on the MECH-2 form are these sensible or total loads?***

Comparison of either sensible loads and sensible capacities or total loads and total capacities can be made on the MECH-2 form (***Nonresidential Manual***, p. 4-72). Be sure to note on the MECH-2 which value you used to size and select equipment.

Q ***When using the prescriptive compliance method for a package HVAC system, can the capacity for both the heating and cooling exceed the maximum allowable loads as calculated on the MECH-2?***

Yes, if it is necessary in order to get the appropriate size equipment. ***Energy Efficiency Standards***, Section 144(a), allows you to select the smallest size, within the available options of the desired equipment line, necessary to meet both heating and cooling loads. For example, assume you have calculated a heating load of 190 kBtu/hour and a cooling load of 110 kBtu/hour. The product line you have selected comes with either a capacity of 170 kBtu/hour heating and 90 kBtu/hour cooling, or 200 kBtu/hour heating and 120 kBtu/hour cooling. The latter piece of equipment is probably the most appropriate selection even though it exceeds both heating and cooling maximum allowable load.

Q ***Can information from MECH 1 Parts 2 and 3 be included in schedules and notes on the plans? Also, if nothing on Parts 2 and 3 is relevant to the job, can they be excluded from the plans?***

(continued on page 7)

Questions and Answers (continued)

With building department approval, the applicant may use alternative formats of these forms, provided the information is the same and "in similar format." If none of the information on Parts 2 and 3 is applicable to the job, these parts do not need to be included on the plans. (***Nonresidential Manual***, p. 4-60.)

Is the Commission planning to develop a mandatory measures form since there is no longer an MF-1 form?

No. The document preparer indicates on the Certificate of Compliance (ENV-1, LTG-1, MECH-1) where this information appears on the plans. The intent of eliminating the form was to have appropriate notes appear on the plans so the contractor will incorporate the features during construction.

If I am using an automatic time switch to control the lights in a single-story,

8,000 square-foot (single meter) building, how many control devices and how many override switches do I need to install?

One automatic time switch with at least two manual overrides. Any building or separately metered space exceeding 5,000 square feet must have some type of shut-off control for every floor (Section 131(d)1). When an automatic time switch is used, an override switch is also required. Each override switch must control an area that is 5,000 square feet or less (Section 131(d)2). The override activates the power within the controlled space allowing lights to be turned on for up to two hours during normally unoccupied times.

I understand that if an automatic time switch is installed to meet the shut-off control requirement of Section 131(d) (Energy Efficiency Standards) it must be certified. Is it true that there are very few certified devices?

As of mid-April, there were 128 devices from 15 different manufacturers (see enclosed list).

When calculating lighting compliance using the tailored method (Energy Efficiency Standards, Section 146(b)3), do I have to calculate the Room Cavity Ratio before entering Table 1-R?

You can always assume a ratio of less than 3.5. The 0 to 3.5 category is the most conservative range of values in the table.

Do hotel/motel guest rooms and high-rise residential occupancies have to meet the kitchen and bathroom lighting requirement applicable to low-rise residential buildings?

The lighting requirements for hotel/motel guest room kitchens and bathrooms are contained in Section 130(b) of the ***Energy Efficiency Standards***, and are the same as those applicable to low-rise residential buildings (Section 150(k)). Up to 10 percent of the number of guest rooms may be exempted from the lighting requirements.

DID YOU KNOW . . . ?

CALBO ABM

At this year's California Building Officials Annual Business Meeting, five people won training trips given away by the California Energy Commission. The trips are to any of the CBCI training classes on the energy standards. Prize winners are:

Dennis Boyd, City of Walnut Creek
E.C. Hoskinson, Contra Costa County
Larry James, City of Gilroy
Don Johnson, City of Menlo Park
Dan Kasperson, City of Suisun

The grand prize drawing for an all-expense-paid trip to CBCI Education Week (San Jose, November 1-5) required participants to answer five tough energy standards-related questions. The grand prize winner is:

Lori Miner, City of Burlingame

Congratulations to the winners!

Standards Implementation Survey

• • • We received over 1,000 responses to the training survey sent out in November 1992. Thank you for taking the time to complete the survey. We are busy compiling the responses to present in a final report.

New Publication

• • • The Directory of Certified Water Heaters (P400-93-024, $16.20) is available.

TRAINING

Date	Location	Sponsor	Topic
6/8	Fresno	CBCI	Nonresidential Mechanical
6/23	Oakland	GDA	Nonresidential Advanced COMPLY 24 Modeling
6/30	Burbank	GDA	Nonresidential Advanced COMPLY 24 Modeling

CBCI: California Building Codes Institute presents training designed for building department personnel, but open to all interested persons. Class fees are $125/one-day or $195/two-day sessions (building department personnel should contact CBCI directly regarding class fees). Contact CBCI at (916) 456-3824.

GDA: Gabel Dodd Associates presents an advanced seminar on the nonresidential performance approach using COMPLY 24. The primary focus of this full-day seminar is on case studies which illustrate modeling building features and systems. Envelope, lighting and HVAC inputs are reviewed and discussed in the context of energy compliance and utility company incentive calculations, which are built into the program. Registration fees are $75 for program users,$150 for non-program users. Contact Gabel Dodd Associates at (510) 428-0803.

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